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*The Third International*

# POWER LINE COMMUNICATIONS

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## WORLD CONGRESS

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*4th - 6th October 2000, The Forum Park Hotel, Geneva*

- Examining the business case for utilities and telecoms operators to deliver power line services
- Reviewing ETSI and CENELEC's progress towards completing the standardisation of broadband power line communications
- Evaluating the most recent technical and commercial trials of power line solutions

*Key companies that you will hear from include:*

**Endesa • Fibrecomm • Matav Hungarian Telecom • Birka Energi  
Cinergy • Online • Evicom**

**Polytrax Information Technology • Itran Communications • Mainnet • Keyin Telecom  
Cisco Systems Enikia • Siemens • Ascom • Conaxion • White Box Solutions • DS2 • PALAS**

*Including A One Day Workshop:*

## **An Introduction To Power Line Communications**

*3rd October 2000, The Forum Park Hotel, Geneva*

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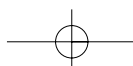
**CENELEC**



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## Why Should You Attend?

*If you only attend one power line conference this year it should be this one!*

Why? Because, of all the events taking place this summer/autumn in Europe, **IIR's Power Line Communications World Congress** is the only truly international power line conference, fully endorsed by the **PLCforum**. To get a full picture of the latest developments in power line communications and to achieve world class success you have to have world class information and skills!

*Take a look at the programme and you will see just how comprehensive the conference is!*

At this conference you will have the chance to hear results from the most recent power line field trials being undertaken by both telecoms companies and utilities. The speakers will also extensively examine the various business cases for utilities to provide power line services.

Standardisation of broadband access may very well be what utilities are waiting for before committing themselves to delivering power line services. During my research many professionals asked the same questions.

- "How long will I have to wait for a standardisation framework to be completed?"
- "What will the standards be for emission levels for power line communications?"
- "What will the impact be on the industry if manufacturers go ahead and roll-out products without a complete standards framework?"

At this conference you will have the unique opportunity to hear from both ETSI and CENELEC, who will fill you in on progress towards the standardisation of broadband power line communications.

Meanwhile, as we are all aware, the debate about the optimum technology for delivering power line services rages on. The speakers I have invited to present at this conference support different solutions and the deeper understanding you will gain will help you evaluate the pros and cons of all the alternatives.

*Without doubt this event will provide lively debate and networking opportunities!*

## PLCforum

Dear Colleagues

The **PLCforum** is a leading international association supporting and promoting the delivery of PLC technologies to the market. The commercial roll-out of Power Line Communication (PLC) is imminent and every day the technology is proving that it can meet the needs of the utilities, operators and end users.

The growing number of companies involved in power line (there are about 60 members of the **PLCforum**) and the increasing activity within the industry show that there has been definite progress towards the availability, as well as the further development, of power line products.

Regular contacts and meetings have taken place for many months now between the PLC community and the regulatory and standardisation bodies. In this field the **PLCforum** plays a leading and co-ordinating role. Moreover, the issues linked with application and service portfolios and business models have been extensively discussed.

The world-wide appeal of PLC is reflected in the geographical profile of our members, who include representatives from Europe, Japan, Malaysia, Israel, Argentina, USA and Canada. The **PLCforum's** objectives are to promote understanding and the implementation of power line communications world-wide.

The **PLCforum** is delighted to endorse IIR's third annual Power Line Communications World Congress and I look forward to meeting you and your colleagues in October.

Yours sincerely,



Jean-Francois Droubay  
Chairman of the **PLCforum**

## IIR's Power Line Communications World Congress Is Endorsed By

### PLCforum

The **PLCforum**, the world-wide organisation bringing together companies with interests in Power Line Communications (PLC), was established on the 23rd / 24th March 2000 in Interlaken, Switzerland in order to lay the foundation for an association dealing with the present and future needs of this technology. The **PLCforum** combines the efforts and activities of two previously acting committees (PTF and IPF).

This Forum is intended to provide a platform for all those interested in PLC – whether they are manufacturers, customers, researchers or governmental bodies – to allow them to exchange and to distribute knowledge about PLC. Members include representatives from manufacturers such as Alcatel, Ascot, Cisco Systems, Philips, Siemens, and Texas Instruments as well as electricity supply companies such as EDF, EnBW, Endesa, Enel, NESA, RWE, Sydkraft, Tiwag and Viken. During the inaugural meeting of the **PLCforum** Mr Jean-Francois Droubay, a member of the Direction de la Stratégie, EDF, was elected as the Chairman of this Association. The **PLCforum** has about 60 members from 4 continents (status 2/06/2000).

Membership allows the possibility to evaluate the market potential as well as the business opportunities for PLC technology. The members are able to meet leading PLC market players and learn about the latest development trends. Moreover dedicated work is conducted within the Technology, Regulatory, Marketing and In-House Working Groups (WG).

For more information on the **PLCforum** or PLC technology please contact: bmp TELECOMMUNICATIONS CONSULTANTS Hotline: +49 211 577 973 22 or e-mail: [plc@bmp-tc.com](mailto:plc@bmp-tc.com)



The International Powerline Communications Forum (IPCF) is the foremost PLC industry online forum with open access. It facilitates the development and deployment of power line communication products and services world-wide, by providing an updated resource to a growing number of subscribers, now in excess of 700 regular users. It is currently growing at approximately 200 new subscribers each month and is set to become the gateway to the PLC community world-wide. Originally developed for the members of the IPF and PTF, the scope of the site has been extended following the merger of those two organisations into the **PLCforum** and the establishment of the HomePlug Alliance. This IPCF site now serves the needs of all companies, investors and individuals needing to stay in touch with this rapidly developing industry. The site is funded by sponsorship from leading companies in the PLC industry.



ETSI (the European Telecommunications Standards Institute) is a non-profit making organization whose mission is to produce the telecommunications standards that will be used for decades to come throughout Europe and beyond.

Based in Sophia Antipolis (France), ETSI unites nearly 773 members from 52 countries inside and outside Europe, and represents administrations, network operators, manufacturers, service providers, technical bodies and users. The Institute's work programme is determined by its members, who are also responsible for approving its deliverables. As a result, ETSI's activities are maintained in close alignment with the market needs expressed by its members.

ETSI plays a major role in developing a wide range of standards and other technical documentation as Europe's contribution to world-wide standardization in telecommunications, broadcasting and information technology. ETSI's prime objective is to support global harmonization by providing a forum in which all the key players can contribute actively. ETSI is officially recognised by the European Commission and the EFTA secretariat.



CENELEC, (the European Committee for Electrotechnical Standardization), is developing a coherent set of voluntary electrotechnical harmonized standards, playing a leading role in the implementation of the internal European market by contributing to the removal of technical barriers to trade. The aim of the CENELEC members and affiliates is to adopt the required

standards, in co-operation with ETSI and CEN, the vast majority of which are identical with IEC standards.

CENELEC also seeks to co-ordinate voluntary certification and testing schemes for electrotechnology. CENELEC produces European Standards, Harmonization Documents, or European Pre-Standards, Reports and European Specifications. Further information can be found at <http://www.cenelec.org>.



CABA is a not-for-profit industry association that promotes advanced technologies for the automation of homes and buildings in North America. A number of resources - the CABA Home & Building Automation QUARTERLY, the Information Series (white papers, research documents), Event Reports (conference, workshop and trade show synopses), and the CABA Web site - have positioned CABA as Your Information Source within the industry. CABA collaborates with and supports many other industry associations and organizations. Visit our website at [www.caba.org](http://www.caba.org).



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## Pre-Conference Workshop

# An Introduction To Power Line Communications

3rd October 2000 - The Forum Park Hotel, Geneva

Designed for those seeking a basic background to power line communications, this half day workshop will be lead by **David Healey, Enikia** with presentations from **Paul Brown, White Box Solutions** and **Dick Mensing, Online**.

Outlining the fundamental technical, commercial and regulatory issues of power line communications you will find this a useful tool for understanding the core issues of this breakthrough technology and it will help you gain a solid framework for making the most of the main conference.

The workshop will run from 12.30 to 16.00 with tea and refreshments served midway through the session.

### Session 1:

#### Examining The Background Of Power Line Communications

- Defining power line communications
  - In-home / 'plug and play' / internal
  - Access/ external
- Examining the impact of the recent liberalisation of regulation in the electricity and telecommunications sectors
- Identifying the differences between broadband power line telecommunications and narrowband power line communications
  - Explaining the increase in interest in broadband power line telecommunications from electricity utilities in recent years
  - Examining the growth of bi-directional power line communications
  - What are the prospects for future developments in broadband and narrowband power line communications and their significance for the telecommunications market?
- Identifying the key players, operators and manufacturers involved in power line communications

**David Healey**  
Vice President  
ENIKIA

### Session 2:

#### Understanding The Key Technical Challenges Of Power Line Communications

- Explaining the different power line communications technologies that have been developed
  - Ripple control
  - CENELEC compliant systems
  - Waveform distribution
  - broadband power line solutions
- Examining the QoS problems faced by manufacturers of power line solutions
- Analysing how broadband power line solutions compare with other access alternatives in terms of speed, bandwidth and reliability
- What frequencies are used for different power line communications solutions?
- Determining how the data signal can be separated from the electricity signal
- What are the thresholds for emissions?

**Paul Brown**  
Chief Executive Officer  
WHITE BOX SOLUTIONS  
Honorary Professor, Department of Communication Systems,  
Lancaster University

### Session 3:

#### Evaluating The Commercial Benefits Of Power Line Communications

- Outlining the applications that power line communications can support
  - Operations-focused services
  - Outage handling
  - Power quality monitoring
  - Network control
  - Predictive maintenance and field force automation
  - Customer-focused services
  - Interactive services
  - Distribution of marketing information
  - Customer load management
  - Energy usage management
  - Telecom intensive applications
- Reviewing the applications of the power line solutions currently available
  - Estimating the market demand for utility-based and telecoms-based power line applications
  - What market penetration can they be expected to achieve?
- Examining which companies are actively trialling power line systems with a view to deployment
- Determining how electricity companies offering power line communications should position themselves in the telecoms market
- Assessing how power line communications contributes to the business case for electricity utilities moving into the telecommunications market
  - Reviewing the competitive advantages of potential power line carriers

**Dick Mensing**  
President  
Online

### Session 4:

#### Examining The Regulatory Issues Surrounding Power Line Communications

- Which are the regulatory bodies concerned with power line communications?
- Examining the viewpoint of national; (i.e. OFTEL, OFFER, The Radiocommunications Agency) and international (ETSI, The European Commission, CISPR, CENELEC, UTC) regulatory bodies regarding ripple control, waveform distribution, CENELEC compliant systems and broadband power line solutions
- Examining the technical standards that currently govern power line solutions
  - What new standards are being developed?
- Determining the role of the *PLCforum* in influencing regulatory decisions

*Speaker to be confirmed*



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# POWER LINE COMMUNICATIONS

## Conference Day One - Wednesday 4th October 2000

9.30 Opening Address From The Chair

9.40 **Reviewing Recent Developments In Power Line Communications**

**Keynote Address**

- Reviewing current progress: clarifying the commercial and technical viability of services over power line for:
  - In-home networking
  - Access via power line
- Discussing the opportunities for providing broadband and narrowband services over power line
  - What are the main hurdles to successfully delivering power line services to the mass market?
- Identifying which companies are actively trialling access and in-home power line solutions
- Assessing the likely implementation and maintenance of power line communications with focus on utility operators
- Examining the role of the **PLCforum** in the world-wide power line market: discussing its targets, vision and activities

**Jean-Francois Droubay**  
Chairman of the PLCforum

10.20 **Assessing How Power Line Communications Compares With Other Broadband Access Technologies**

- Comparing power line communications with other access technologies on the basis of time to market, ease of deployment, reliability, bandwidth, range of services, speed and coverage
  - ADSL
  - Fibre
  - Cable modems
  - Broadband wireless access
- Quantifying the cost and revenue potential of power line communications versus alternative access technologies
  - How does this impact the business case for power line communications?
- Discussing the impact of local loop unbundling on the deployment of power line communications
  - Examining the implications for power line of the imminent roll-out of ADSL to the mass market
- What share of the broadband access market will power line communications be expected to gain over the next 10 years?

**Olga Zablocka**  
Consultant

**BMP TELECOMMUNICATIONS CONSULTANTS**

11.00 Morning Coffee

11.20 **Update On CENELEC's Progress Towards Producing A Standard With Acceptable EM Emissions For High-Frequency Power Line Communications**

- What is CENELEC's role in the standardisation of power line communications?
- Revealing CENELEC's progress towards standardising low-level protocols for both external and in-house systems
- Outlining considerations governing the permissible level of radiated emissions in power line standards
- Delineating the division of work between ETSI and CENELEC
  - Defining the role of the CENELEC/ETSI Joint Working Group on EMC of Conducted Transmission Networks
- Predicting timescales for a CENELEC standard for high-frequency power line

**John Ryan**

Protection Engineer

**ELECTRICITY ASSOCIATION**

Secretary of CENELEC SC205A and Acting Secretary of CENELEC/ETSI JWG on EMC of Conducted Transmission Networks

12.00 **Examining ETSI's Progress Towards Establishing Standards For Protocols For Power Line Communications**

- What is ETSI's role in the development of standards for power line communications?
- Revealing ETSI's progress towards standardising the higher level protocols for power line communications
- Predicting timescales for finalising protocol standards for power line communications
- Discussing when and how CENELEC and ETSI will collaborate on the standardisation of power line

**August Blunsch**

Director, PLC Regulation and Standardisation

**ASCOM**

Chairman of ETSI PLT and Member of the Board, PLCforum

12.40 Lunch

1.50 **Discussing The RA And Reg TP's Position On Acceptable EM Emission Levels For Broadband Power Line Communications Against The Background Of International Regulation**

- Overview of the international regulatory landscape governing the electricity and telecoms businesses
- Predicting potential interference of emissions from broadband power line with radio spectrum users
  - Revealing emission level measurements from high speed data power line solution trials

- Comparing the EM emission levels produced by high speed data transmission over power line with those produced by ADSL
  - What are the implications for the mass deployment of power line communications?
- Discussing the rationale behind the agencies' preference for low EM emissions over a broad frequency band as opposed to high EM emissions over a narrow frequency band
- Have the RA and RegTP been too stringent in their recommendation that the noise level for power line communications should be 0dBuV/M?
  - How can this noise floor be achieved?

**David E. Hines**

Managing Director

**ELECTRICOM**

2.30 **Outlining The Capabilities And Limitations Of Competing Power Line Technologies**

- Discussing the pros and cons of the different technologies that are about to be rolled out commercially
  - Multi-carrier systems such as OFDM
  - Spread spectrum systems
  - Single-carrier systems such as PSK and FSK
- What are the current speed and capacity thresholds of the different power line technologies for data services?
  - Assessing the technical challenges of sending high speed signals over the electricity network
- What frequencies are used for the different power line solutions and what are the implications for their co-existence?
- Examining the potential of implementing multiple power line technologies in the electricity network to optimise service delivery

**Professor Paul Brown**

Chief Executive Officer

**WHITE BOX SOLUTIONS**

Honorary Professor, Dept of Communication Systems, Lancaster University

3.10 Afternoon Tea

3.30 **Outlining The Advantages Of The 'Chimney Approach' As The Most Favourable Methodology To Implement For The Access Domain**

- Understanding the basic requirements for 'last mile' access power line systems and determining factors for spectrum allocation for the 'chimney approach'
  - Understanding the criteria used to develop the present 'chimney approach' scheme
- Analysing the characteristics and performance of a typical system operating in accordance with the 'chimney approach'
- Examining the implications of using chimney technology for in-home and access solutions
- Determining the signal injection strength required in order to eliminate the need for repeaters between the substation and customer premises
- Discussing the economic advantages of chimney technology and examining whether the regulatory framework should be adjusted
- Predicting timescales for the commercial roll-out of 'chimney approach' compatible systems

**Markus Reigl**

Director, ICN Group Project Power Line Communications

**SIEMENS**

4.10 **Detailing The Commercial And Technical Merits Of Deploying Spread Spectrum Low Emission Technology**

- Assessing the suitability of spread spectrum technology for in-home and access power line communications
- Analysing independent assessments of noise levels using spread spectrum technology
- Outlining advances in spread spectrum technology that have significantly reduced the attenuation of the power line signal over distance
  - Examining the results of technical trials of spread spectrum technology
  - Quantifying the egress and ingress levels of the current technology
- Determining to what extent spread spectrum technology has a competitive advantage over chimney technology
  - Examining the commercial reasons for choosing spread spectrum technology over other modulation schemes for power line communications

**Frank Brandt**

Managing Director

**CONAXION**

4.50 Closing Remarks From The Chair

5.00 End Of Conference Day One

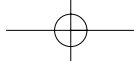
### Drinks Reception

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You are cordially invited to join your colleagues to discuss the day's issues in a relaxed and informal environment



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# COMMUNICATIONS WORLD CONGRESS

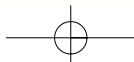
## Conference Day Two - Thursday 5th October 2000

<p>9.30 Opening Address From the Chair</p> <p>9.40 <b>Quantifying The Market Size And Revenue Potential Of Power Line Communications</b></p> <ul style="list-style-type: none"> <li>• Examining the application differences between narrowband and broadband power line technologies</li> <li>• Identifying which customer-focused and operations-based applications present the greatest revenue opportunities</li> <li>• Determining in which geographical markets power line communications will have the greatest revenue potential as:             <ul style="list-style-type: none"> <li>- Access solutions</li> <li>- In-home networking solutions</li> </ul> </li> <li>• Estimating the revenue projections for narrowband and broadband power line applications</li> <li>• Evaluating the potential impact of power line communications on an electricity company's revenue per household             <ul style="list-style-type: none"> <li>- To what extent is power line communications a viable long-term business opportunity?</li> </ul> </li> </ul> <p><b>Steve Oschman</b> <i>Manager, Telecommunications Business Development</i> <b>CINERGY</b></p> <p>10.20 <b>Identifying Market Segments And Developing Pricing Strategies To Stimulate Market Demand For Power Line Solutions</b></p> <ul style="list-style-type: none"> <li>• Identifying the opportunities for business and consumer markets that power line services present for:             <ul style="list-style-type: none"> <li>- Corporate market</li> <li>- SME market</li> <li>- Consumer market</li> </ul> </li> <li>• Identifying market segments for which the take-up of power line communications will be greatest for:             <ul style="list-style-type: none"> <li>- Local access</li> <li>- In-home networking</li> </ul> </li> <li>• Examining whether the brand name of the utility will increase customer interest in services over power line             <ul style="list-style-type: none"> <li>- Evaluating whether customers would be more reassured if a telecoms operator were fronting the venture</li> </ul> </li> <li>• Developing pricing strategies for services over power line             <ul style="list-style-type: none"> <li>- How much are customers willing to pay to subscribe to in-home and access power line services?</li> <li>- Determining at what level customer premises equipment (CPE) should be priced in order to encourage the take-up of services over power line</li> </ul> </li> <li>• Evaluating customer acceptance of and willingness to pay for a range of value added services including             <ul style="list-style-type: none"> <li>- Energy management</li> <li>- Home and security appliances</li> <li>- Electrical heating control</li> </ul> </li> </ul> <p><b>Dr Werner Pohl</b> <i>Chief Executive Officer</i> <b>POLYTRAX INFORMATION TECHNOLOGY</b></p> <p>11.00 <b>Case Study: Successfully Marketing Access Power Line Communications To Utility Companies And In-Home Power Line Solutions To The Consumer</b></p> <ul style="list-style-type: none"> <li>• Developing strategies for marketing power line communications to electricity companies             <ul style="list-style-type: none"> <li>- Discussing Oneline's 'partner solution' concept</li> </ul> </li> <li>• Successfully communicating your business strategy to individual electricity companies by outlining the modifications necessary to the business blueprint due to:             <ul style="list-style-type: none"> <li>- Geographical location</li> <li>- Number of subscribers on each substation local electricity network</li> <li>- Type and design of the customer's premises</li> <li>- Requirements of business and residential customers</li> </ul> </li> <li>• Discussing Oneline's strategy for marketing in-home power line to non-computer literate customers             <ul style="list-style-type: none"> <li>- Determining the impact of the size, complexity of use and cost of the CPE on customer take-up</li> </ul> </li> <li>• Overcoming the marketing and technical challenges of becoming an international power line provider</li> </ul> <p><b>Dick Mensing</b> <i>President</i> <b>ONELINE</b></p> <p>11.40 Morning Coffee</p> <p>12.00 <b>Examining The Business Case For A Utility To Offer Access Over Power Line Via Their Electricity Network</b></p> <ul style="list-style-type: none"> <li>• Examining potential business models for utilities offering access services over power line             <ul style="list-style-type: none"> <li>- Directly to the customer</li> <li>- Indirectly via their telecoms subsidiary</li> <li>- Indirectly in collaboration with a telecoms operator</li> </ul> </li> <li>• To what extent will the company need to restructure to efficiently offer services over power line?             <ul style="list-style-type: none"> <li>- Determining what new expertise an electricity company will require to successfully enter the communications market</li> </ul> </li> <li>• What are customer expectations for access via power line in terms of QoS, price, etc?</li> <li>• Determining what price and market penetration levels would need to be established in order to make access via power line a viable investment</li> <li>• What technical problems have yet to be overcome?</li> <li>• Estimating timescales for the commercial roll-out of services over power line</li> </ul> <p><b>Bertil Österlind</b> <i>Senior Consultant</i> <b>BIRKA ENERGI</b></p> <p>12.40 <b>Evaluating The Business Case For A Telecoms Company To Gain Access To The Electricity Network In Order To Offer Power Line Services To The Customer</b></p> <ul style="list-style-type: none"> <li>• Examining the opportunities afforded to the telecoms operator by partnering with an electricity company to provide communications services over power line</li> </ul>	<p>1.20 Lunch</p> <p>2.30 <b>Examining The Business Case For A Utility To Offer In-Home Networking And Access Over Power Line In A Competitive Market</b></p> <ul style="list-style-type: none"> <li>• Determining the need for combined in-home power line services and access via power line</li> <li>• Developing pricing strategies for services over power line</li> <li>• How broad a portfolio of services will it be necessary to offer in order to be competitive with other access and in-home technologies?</li> <li>• Examining how the utility should be restructured in order to efficiently offer services over power line             <ul style="list-style-type: none"> <li>- What new expertise will be needed by the utility company to successfully enter the communications market?</li> </ul> </li> <li>• Forecasting timescales for the commercial roll-out of services over power line</li> </ul> <p><b>Per Wigren</b> <i>Manager of Business Development</i> <b>EVICOM</b> <i>Board Member of the PLCforum</i></p> <p>3.10 <b>Case Study: Examining The Commercial Potential Of Power Line Services In Malaysia</b></p> <ul style="list-style-type: none"> <li>• Determining which power line access solution will be suitable for implementation in the Malaysian electricity networks             <ul style="list-style-type: none"> <li>- Discussing why fibre optic in the trunk network and power line in the access network is the best solution</li> </ul> </li> <li>• Justifying the business case for providing customers with power line services in Malaysia</li> <li>• Clarifying the roles of the operator, utility and content provider in delivering power line communications in order to establish a successful joint venture</li> <li>• Interpreting the results of Fibrecomm's power line trials</li> <li>• Outlining a timetable for the roll-out of power line services in Malaysia</li> </ul> <p><b>Mior-Azri Ismail</b> <i>Assistant General Manager, Business and Product Development</i> <b>FIBRECOMM</b></p> <p>3.50 Afternoon Tea</p> <p>4.10 <b>Case Study: PALAS - Development, Testing And Implementation Of New Power Line Based Solutions And Services</b></p> <ul style="list-style-type: none"> <li>• Clarifying the objectives of the PALAS project</li> <li>• Assessing the results of the market evaluation study             <ul style="list-style-type: none"> <li>- Qualification, quantification and general trends</li> <li>- Regulation in the power line market</li> </ul> </li> <li>• Strategies for reducing the time to market of power line solutions</li> <li>• Outlining the pros and cons of existing power line technologies and services</li> <li>• Examining backbone access scenarios</li> <li>• Identifying potentially successful in-home solutions</li> <li>• Evaluating field trials in Sweden and Germany             <ul style="list-style-type: none"> <li>- Open Application Platform</li> <li>- 1st Generation Trial (access trial providing telephony, Internet)</li> <li>- 2nd Generation Trial in co-operation with Oneline (telephony, broadband Internet, meter reading (gas/water/electricity), and low voltage, in-home as well as medium voltage power line communications)</li> </ul> </li> </ul> <p><b>Uwe Leicht</b> <i>Head of European Affairs</i> <b>TELEPORT SACHSEN-ANHALT</b> <i>Deputy PALAS Project Manager</i></p> <p>4.50 <b>Case Study: Examining The Commercial Strategy Of EnBW/tesion To Introduce Power Line Communications Services To The European Market</b></p> <ul style="list-style-type: none"> <li>• Clarifying the business reasons for a utility company to introduce power line communications services into their service portfolio</li> <li>• Analysing the impact on EnBW of the RegTP's licensing requirements</li> <li>• Discussing the impact of the introduction of power line communications on competition in the electricity market</li> <li>• Outlining the marketing strategy for EnBW's introduction of power line communications services to customers</li> <li>• Examining the results of the EnBW field trials and discussing further trial proposals</li> <li>• Outlining EnBW's planned power line communications service portfolio</li> </ul> <p><b>Dr Juergen Unfried</b> <i>Project Director</i> <b>ENBW/TESION</b> <i>Board Member of the PLCforum</i></p> <p>5.30 Closing Address From The Chair</p> <p>5.40 End Of Conference Day Two</p>
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Please turn over for Conference Day Three...



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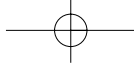
# POWER LINE COMMUNICATIONS

Conference Day Three - Friday 6th October 2000

- 9.30 Opening Address From The Chair
- 9.40 **Overcoming The Difficulties Of Achieving Co-Existence Of Access And In-Home Power Line Communications Systems**
- Identifying and overcoming the technical challenges of achieving co-existence of in-home and access power line solutions
  - Determining the effect on QoS of the different frequencies used for in-home and access solutions
    - Determining whether in-home and access solutions can be used simultaneously in close proximity
  - Discussing techniques for achieving co-existence of in-home and access power line systems
    - Time slot assignment
    - Frequency allocation
    - Code division multiplexing
  - Outlining the standardisation required for the successful co-existence of access and in-home systems
- Jorge Blasco**  
Director  
DS2  
Board Member of the PLCforum
- 10.20 **Explaining A Possible Technical Solution For The Problem Of Co-Existence Of In-Home And Access Power Line Communications**
- Predicting market demand for broadband power line services for:
    - Access
    - In-home systems
    - Access and in-home systems as a bundled package
  - Anticipating the bandwidth needed to meet the requirements of future broadband services over power line
  - Outlining the implications of in-home and access power line solutions being used in parallel over the same power line
  - Examining possible solutions that provide better utilisation of the existing bandwidth to support broadband services over power line: how can they be integrated with power line modems?
- Rafi Ben-Atar**  
Vice President, Sales and Marketing  
MAINNET
- 11.00 Morning Coffee
- 11.20 **Examining The Demand For And Provision Of Power Line In-Home Networking Solutions In The USA**
- Discussing the objectives of the HomePlug Alliance
  - Examining customer demand for in-home power line services and predicting future in-home service requirements
  - Outlining progress towards mass deployment of in-home power line systems in the USA
    - Comparing the speed and capability of current in-home power line solutions
    - Estimating timeframes for the roll-out of future in-home power line solutions
  - Outlining the new faster provisioning solutions
  - How can successful integration with other networks such as fixed wireless access, fixed network access and cellular be achieved?
  - Identifying the measures that need to be taken to ensure the security of the power line systems
- Philip G. Hunt**  
Manager, Global Alliances  
CISCO SYSTEMS  
Vice President, HomePlug Alliance
- 12.00 **Evaluating The Pros And Cons Of Different Modulation Techniques For In-Home Power Line Communications**
- Characterising the power line network to ensure high reliability and quality of service for high speed broadband services
  - Evaluating the pros and cons of the different modulation techniques (FSK, spread spectrum, OFDM etc) and examining possible receiving algorithms
  - Clarifying the technical and commercial implications of the alternative modulation techniques for in-home power line communications
  - Examining the results of in-home power line communications field trials
- Dr Mordechai Mushkin**  
Vice President  
ITRAN COMMUNICATIONS
- 12.40 Lunch
- 1.50 **Determining The Capability Of Broadband Power Line Solutions For Delivering In-Home Networking Services**
- Examining the architecture required for broadband in-home power line communications
  - What transmission rates can realistically be achieved over an in-home power line communications network?
  - Examining the applications that power line can deliver
    - Broadband Internet
    - Telecommuting
    - Home LANs
    - Smart appliances
    - Interactive games
    - Music in every power socket
    - Interactive TV
- Jarek Chylinski**  
Vice President, Global Marketing  
ENIKIA
- 2.30 **Case Study: Preparing For The Technical Challenges Of Deploying Power Line Communications Over Your Electricity Network**
- To what extent is it necessary to characterise your entire network before deploying power line?
  - Clarifying the hardware and software modifications required in the electricity network for:
    - Access solutions
    - In-home solutions
  - Evaluating the technical implications of implementing the more robust but less efficient single carrier technology versus the more complicated but more efficient multi-carrier technology
  - Examining whether different power line technologies will be suitable for different parts of the network depending on:
    - Topography
    - Length of the lines from the substation to the customer premises
  - Discussing the results of field trials
- Josep M. Selga**  
Director of Power Line Project  
ENDESA
- 3.10 Afternoon Tea
- 3.30 **Overcoming The Challenges Of Achieving Quality Of Service Over Power Line**
- Identifying the quality of service (QoS) challenges over power line for:
    - Internet access
    - Voice
    - Data
    - Determining the QoS guarantees that would have to be offered to customers for voice and Internet over power line
  - Determining how to achieve a predictable, consistent and stable delivery of data packets over the network
    - To what extent can bandwidth and hence QoS be guaranteed over power line?
  - Determining the impact of the following factors on QoS for data, Internet access and voice over power line
    - Security
    - Reduction of packet loss and delay
    - Traffic incidents in the network
  - Analysing the difficulties of separating voice and data signals from the noise on the electricity network for low and high signal injection technologies and determining the implications for QoS
- Hakan Fouren**  
Marketing Director  
DS2
- 4.10 **Case Study: Analysing The Technical And Commercial Implications Of Implementing Power Line Communications: Learning From The Experience Of Keyin Telecom**
- Analysing the results of power line field trials for broadband access with utilities in Germany, Malaysia and Korea by considering:
    - QoS
    - Data rates
    - EMC emission levels
  - Examining how Keyin Telecom overcame the technical challenges of sending high speed signals over power line
  - Utilising the field trial results to forecast consumer interest in power line services and predicting which applications will drive the market take-up
  - Examining how field trial results will be used to develop power line communications in Germany, Malaysia and Korea and determining whether further trials are necessary
- Dr Gi-Won Lee**  
Chief Executive Officer  
KEYIN TELECOM
- 4.50 Closing Address From The Chair
- 5.00 End Of Conference



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## What Have Past Delegates Had To Say About Our Events?

*"The conference gave an excellent overview of the opportunities and technical solutions for power utilities wishing to offer telecoms services"*

**PW, Norwegian Post and Telecommunications**  
@ IIR's Power Line Communications, September 1998

*"Stimulating and illuminating - a good mix of topics - technical, commercial and legal"*

**Azizan Lebai Manat, Wirazone**  
@ IIR's Power Line Communications, September 1998

*"I really enjoyed participating in this conference and I achieved my objectives in attending"*

**Eduardo Rabboni, CTBC Telecom**  
@ IIR's Power Line Communications, September 1998

*"The conference gave me the necessary information to continue our PLT work"*

**Tord Sjolund, Telia**  
@ IIR's Power Line Communications, September 1998

*"It was very interesting to meet the key players in an emerging market"*

**RW Beebe, Guernsey Electricity**  
@ IIR's Power Line Communications, September 1998

*"This is the first time ever to have an event covering all levels of PLC technology"*

**Uri Neeman, IC Com**  
@ IIR's Power Line Communications World Congress, May 1999

*"A very well balanced and informative event"*

**David Flin, Wilmington Publishing**  
@ IIR's Power Line Communications World Congress, May 1999

*"In two days the conference provided a complete view of progress and deployment of all kinds of power line communications"*

**Boscand Corrine, Alcatel Microelectronics**  
@ IIR's Power Line Communications World Congress, May 1999

## Any Questions?

If you would like any more information about the event please contact **Dr Rachel Thomas** on Tel: +44 (0)20 7915 5159, Fax: +44 (0)20 7915 5001 or email: [rthomas@iir-conferences.com](mailto:rthomas@iir-conferences.com)

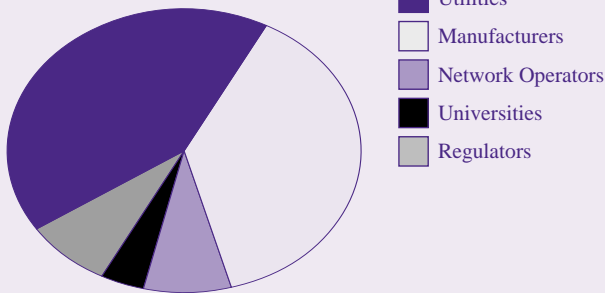
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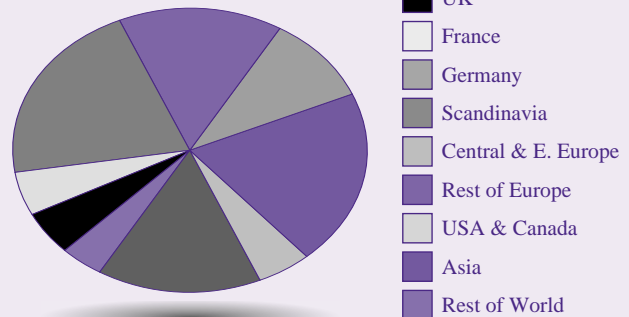
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## Profile of Delegates at IIR's 2nd Annual Power Line Communications World Congress, May 1999

By Industry



By Country



## Sponsored by



HomePlug Powerline Alliance, Inc. is a non-profit corporation established to provide a forum for the creation of specifications for home powerline networking products and services; and, to accelerate the demand for these products and services throughout the sponsorship of market and user education programs. HomePlug's vision is to deliver Internet and multimedia from every home power outlet and to enable the home through worldwide home powerline networking standards.

The alliance is seizing the tremendous opportunity to cooperatively capitalize on global home networking market by deploying powerline, the most pervasive home networking medium. HomePlug's specification will enable cost effective, interoperable solutions that address market needs.

Industry leaders spanning technology, silicon, software, hardware, retail and services have joined HomePlug to initiate and encourage industry discussion and consensus building for home powerline networking. HomePlug founding members include 3Com, AMD, Cisco Systems, Compaq, Conexant, Enikia, Intel, Intellon, Motorola, Panasonic, S3's Diamond Multimedia, RadioShack and Texas Instruments.

HomePlug has established an open forum, with participant and adopter levels of membership available. Working together with all its members and selecting a baseline technology this past June, HomePlug is aggressively developing a specification to enable HomePlug compliant products by the end of 2000. For information on joining the HomePlug Alliance, please visit [www.homeplug.org](http://www.homeplug.org).

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